Using Java's printf( ) Method

The printf( ) method automatically uses Formatter to create a formatted string.

The printf( ) method is defined by both PrintStream and PrintWriter.

For PrintStream, printf( ) has these forms:

1. PrintStream printf(String fmtString, Object ... args)
2. PrintStream printf(Local loc, String fmtString, Object ... args)

The first version writes args to standard output in the format specified by fmtString, using the default locale.

The second lets you specify a locale.

```
%[argument_index$][flags][width][.precision]conversion
                          square brackets is for optional format.

conversion specifying how to display the argument:
                'd': decimal integer
                'o': octal integer
                'x': hexadecimal integer

                'f': decimal notation for float
                'g': scientific notation (with an exponent) for float
                'a': hexadecimal with an exponent for float

                'c': for a character
                's': for a string.
                'b': for a boolean value, so its output is "true" or "false".
                'h': output the hashcode of the argument in hexadecimal form.
                'n': "%n" has the same effect as "\n".


 argument_index:
               "1$" refers to the first argument,
               "2$" refers to the second argument,
               '<' followed by $ indicate that the argument should be the sa
               me as that of the previous format specification


 flags:                '-' left-justified
                       '^' and uppercase
                       '+' output a sign for numerical values.
                       '0' forces numerical values to be zero-
                       padded.


 width:
                       Specifies the field width for outputting the argument
                       and represents the minimum number of characters to be
                       written to the output.
```

precision: used to restrict the output depending on the conversion. It specifies the number of digits of precision when outputting floating-point values.

```
public class MainClass {
  public static void main(String args[]) {
    System.out.printf("%d %(d %+d %05d\n", 3, -3, 3, 3);

    System.out.printf("Default floating-point format: %f\n", 1234567.123);
    System.out.printf("Floating-point with commas: %,f\n", 1234567.123);
    System.out.printf("Negative floating-point default: %,f\n", -
1234567.123);
    System.out.printf("Negative floating-point option: %,(f\n", -
1234567.123);

    System.out.printf("Line-up positive and negative values:\n");
    System.out.printf("% ,.2f\n% ,.2f\n", 1234567.123, -1234567.123);
  }
}


/*



3 (3) +3 00003
Default floating-point format: 1234567.123000
Floating-point with commas: 1,234,567.123000
Negative floating-point default: -1,234,567.123000
Negative floating-point option: (1,234,567.123000)
Line-up positive and negative values:
 1,234,567.12
-1,234,567.12
*/
```

Formatting Numerical Data:

```
public class MainClass {

  public static void main(String[] a) {

    double x = 27.5, y = 33.75;

    System.out.printf("x = %f y = %g", x, y);

  }
}
```

```
x = 27.500000 y = 33.7500
```

```
public class MainClass {

  public static void main(String[] args) {

    int a = 5, b = 15, c = 255;

    System.out.printf("a = %d b = %x c = %o", a, b, c);

  }
}
```

```
a = 5 b = f c = 377
```

```
public class MainClass {

  public static void main(String[] args) {

    double x = 27.5, y = 33.75;

    System.out.printf("x = %2$f y = %1$g", x, y);

  }
}
```

```
x = 33.750000 y = 27.5000
```

```
public class MainClass {

  public static void main(String[] args) {

    int a = 5, b = 15, c = 255;

    System.out.printf("a = %3$d b = %1$x c = %2$o", a, b, c);

  }
}
```

```
a = 255 b = 5 c = 17
```

Specifying the Width and Precision

```
public class MainClass {

  public static void main(String[] args) {

    double x = 27.5, y = 33.75;

    System.out.printf("x = %15f y = %8g", x, y);

  }
}
//x =       27.500000 y =  33.7500
```

```
public class MainClass {

  public static void main(String[] args) {

    int a = 5, b = 15, c = 255;

    System.out.printf("a = %1$5d b = %2$5x c = %3$2o", a, b, c);

  }
}
// a =     5 b =     f c = 377
```

```
public class MainClass {

  public static void main(String[] args) {

    int a = 5, b = 15, c = 255;

    System.out.printf("%na = %1$-5d b = %2$-5x c = %3$-5o", a, b, c);

  }
}
// a = 5     b = f     c = 377
```

```
public class MainClass {

  public static void main(String[] args) {

    double x = 27.5, y = 33.75;

    System.out.printf("x = %15.2f y = %14.3g", x, y);

  }
}
//x =           27.50 y =           33.8
```